



PATENT

Docket No. 9792909-0111  
(P99-2641)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Hatazawa *et al.*

Serial No.: 09/446,641

Examiner: T. Dove

Filed: December 22, 1999

Group Art Unit: 1745

For: SOLID-ELECTROLYTE  
SECONDARY BATTERY

RECEIVED

MAR 27 2002

TC 1700

DECLARATION UNDER 37 C.F.R. § 1.132

The Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

I declare that I am an inventor of pending application Serial Number 09/446,641, filed December 22, 1999.

I hereby declare as follows:

1. Batteries utilizing a fluorocarbon polymer having a weight-average molecular weight of greater than 580,000 as the matrix polymer of a solid electrolyte exhibit superior initial characteristics and long-term reliability relative to fluorocarbon polymer having a weight-average molecular weight less than 580,000.

2. An experiment was performed that evidences the criticality of utilizing a fluorocarbon polymer having a weight-average molecular weight of greater than 580,000 as the matrix polymer of a solid electrolyte. Eight plate-shaped gel electrolyte batteries, each having a fluorocarbon polymer with a different weight-average molecular weight, were prepared as in Experimental embodiment 3 on page 18 of the specification. The eight batteries were subjected to 1C charge/1C discharge cycle tests to measure discharge temperature characteristics from -20°C to a room temperature (23°C) after 500 cycles and 1000 cycles. The results of both cases are shown in the attached Figures 4 and 5.

3. Batteries utilizing a fluorocarbon polymer having a weight-average molecular weight of greater than 550,000 exhibit satisfactory discharge temperature characteristics from an initial state to 500 cycles, as recorded in Figure 4. However, after 1000 cycles, the discharge temperature characteristics become poorer, and especially under the temperature of lower than 10°C, the deterioration of the discharge temperature characteristics of batteries

utilizing a fluorocarbon polymer having a weight-average molecular weight of less than 580,000 is great, as recorded in Figure 5.

4. It is preferable in the art to maintain discharge temperature characteristics by 70% or more after long-term use from the initial state to secure the quality of the product for the user. Figure 5 depicts a large difference in the discharge temperature characteristics between a battery utilizing a fluorocarbon polymer having a weight-average molecular weight of greater than 570,000 and that of 580,000. Therefore, this experiment demonstrates that a solid electrolyte secondary battery having both superior initial characteristics and long-term reliability can be provided when a fluorocarbon polymer having a weight average molecular weight of greater than 580,000 is used as the matrix polymer of a gel electrolyte.

5. I further declare that all statements made herein of my own knowledge are true, that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both (18 U.S.C. § 1001), and may jeopardize the validity of the application or any patent issuing thereon.

Tsuyonobu Hatazawa  
TSUYONOBU HATAZAWA

November 21, 2001  
Date

Koichiro Kezuka  
KOICHIRO KEZUKA

19th, Nov, 2001  
Date

Yukiko Iijima  
YUKIKO IIJIMA

21st, Nov, 2001  
Date



**DOCKET NO. 9793822-0111**

**SVU/JVH**

**01/14/02**

**Patent Office Mail Room: Will you  
please affix the Patent Office stamp  
and return this card to acknowledge  
receipt of the following documents:**

**Applicant: T. Hatazawa, et al.  
Serial No.: 09/446,641  
Filing Date: December 22, 1999  
Client: A. Koike & Co.**

**Title: SOLID-ELECTROLYTE SECONDARY BATTERY**

- 1. Transmittal Letter (1 page - in duplicate)**
- 2. Response to Final Office Action (5 pages)**
- 3. Seven (7) English abstracts of non-English references**
- 4. Declaration under 37 CFR 1.132**
- 5. Notice of Appeal (1 page - in duplicate)**
- 6. Check in the amount of \$320.00**
- 7. Petition for Extension of Time (1 page - in duplicate)**
- 8. Check in the amount of \$920.00**
- 9. Return receipt postcard**

**All mailed to the U.S. Patent and Trademark Office by First Class Mail on  
February 9, 2001**

**JAN. 14 2**

**RECEIVED**

**MAR 27 2002**

**TC 1700**

# Sonnenschein

SONNENSCHN NATH & ROSENTHAL

8000 SEARS TOWER, CHICAGO, IL 60606

CHECK NO.: 1152692

REF. #	INV. #	DATE	INVOICE AMOUNT	INVOICE DESCRIPTION	AMOUNT PAID
9901089	0111	01-11-02	320.00	09793822-0111	320.00
TOTAL AMOUNT PAID					320.00



RECEIVED

MAR 27 2002

TC 1700

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND ON WHITE PAPER.

<b>SONNENSCHN</b> SONNENSCHN NATH & ROSENTHAL 8000 SEARS TOWER, CHICAGO, ILLINOIS 60606		<b>CITIBANK</b> CITIBANK, N.A. 60 WALL STREET, NEW YORK, NY 10005		<b>CHECK NO.</b> 1152692
<b>CHECK DATE</b> 01/11/02	<b>CITIBANK DELAWARE</b> A Subsidiary of Citicorp ONE PENNS WAY NEW CASTLE, DE 19720	<b>CHECK AMOUNT</b> \$*****320.00		
THREE HUNDRED TWENTY AND 00/100 Dollars				
<b>PAY TO THE ORDER OF</b>	<b>ASSISTANT COMMISSIONER FOR PATENTS</b> WASHINGTON, DC 20231			

1152692 0311002091

38857878

BC

# Sonnenschein

SONNENSCHN NATH & ROSENTHAL

8000 SEARS TOWER, CHICAGO, IL 60606

CHECK NO.: 1152691

REF. #	INV. #	DATE	INVOICE AMOUNT	INVOICE DESCRIPTION	AMOUNT PAID
9901090	0111	01-11-02	920.00	09793822-0111	920.00
TOTAL AMOUNT PAID					920.00

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND ON WHITE PAPER.

## Sonnenschein

SONNENSCHN NATH & ROSENTHAL

8000 SEARS TOWER, CHICAGO, ILLINOIS 60606

Chicago, Illinois 60606

CHECK NO. 1152691

CHECK DATE  
01/11/02

CITIBANK DELAWARE  
A Subsidiary of Citicorp  
ONE PENN'S WAY  
NEW CASTLE, DE 19720

CHECK AMOUNT

\$\*\*\*\*\*920.00

NINE HUNDRED TWENTY AND 00/100 Dollars

PAY  
TO THE  
ORDER OF

ASSISTANT COMMISSIONER FOR  
PATENTS  
WASHINGTON, DC 20231

⑈1152691⑈ ⑆031100209⑆

38857878⑈

36